

DOCUMENT RESUME

ED 348 953

IR 015 614

TITLE The California Master Plan for Educational Technology. Submitted to the California Legislature April 22, 1992.

INSTITUTION California State Planning Commission for Educational Technology.

PUB DATE 22 Apr 92

NOTE 31p.; For a related report, see IR 015 612.

PUB TYPE Legal/Legislative/Regulatory Materials (090)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS Advisory Committees; *Computer Networks; *Educational Planning; *Educational Technology; Elementary Secondary Education; Higher Education; State Legislation; *State Programs; *Statewide Planning; Telecommunications

IDENTIFIERS *California

ABSTRACT

The California Planning Commission for Educational Technology was established by state legislation (AB 1470) in 1989 to develop a California Master Plan for Educational Technology for K-12 education, the California Community Colleges, the University of California, and the California State University. The Commission discussed multiple issues; sponsored a summit conference on educational technology; gathered information on existing programs in California and other states; reviewed a variety of evaluation reports; sought the advice of educators and employers; and reviewed published and unpublished documents on education technology. The Commission has identified a number of objectives crucial to the future success of education in California and technology's contribution to that success. These objectives are incorporated in the nine recommendations developed by the Commission: (1) provide access to technology in every learning environment; (2) provide professional development and support; (3) establish and coordinate a statewide integrated linking of voice, video, and data networks to be called the Golden State Education Network; (4) establish and improve instructional and information resources; (5) establish a statewide student data resource for educators; (6) establish a statewide administrative/management information resource; (7) establish a state-level intersegmental education council and an industry council to collaboratively implement the Master Plan and to develop future plans; (8) provide for ongoing evaluation of the Master Plan; and (9) develop funding mechanisms to carry out these recommendations. A 16-item bibliography and a list of the members of the Commission are included. (Contains 9 references.) (ALF)

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The California Master Plan for Educational Technology



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California Legislature
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The California Master Plan for Educational Technology

**Prepared by the
California Planning
Commission for
Educational Technology**

**Submitted to the
California Legislature
April 22, 1992**

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FOREWORD

To Governor Wilson, the California Legislature, the State Board of Education, Superintendent Honig, the Governors of the California Community Colleges, the Board of Trustees of the California State University, the Regents of the University of California, the California Postsecondary Education Commission, and the people of California:

This California Master Plan for Educational Technology is submitted to you in compliance with the 1989 Farr, Morgan, Quackenbush Technology Act (AB 1470).

The California Master Plan for Educational Technology represents consensus built around a vision for California's lifelong learners. Writing the Plan posed a unique set of problems for the Commissioners. California is very large, and geographically diverse, with a complex population expressing a multitude of educational needs. Hearing from all stakeholder groups was an enormous task, a process that challenged the educational segments, kindergarten through postsecondary. Discovering ways to mutually understand the many and differing student and teacher requirements fostered new thinking and created lively discussion and planning sessions.

Although California currently ranks as one of the world's top rated economic powers, its education community lags behind other states in progress toward integrating educational technology into its various instructional and operational levels. Instead of taking advantage of its range of benefits and connectivity, technology is often inequitably available, treated in isolation and away from the programs it is designed to serve. As a result, long term, comprehensive planning has been forsaken in favor of unequal, piecemeal, and often redundant technology use.

The California Planning Commission for Educational Technology recognizes that while California students attend classes, the rapid pace of technology is challenging traditional notions of educational methodology. The Information Age has provided a whole new world of resources and information for those engaged in all forms of lifelong learning. The Commission believes California's learners must have critical thinking and analytic problem solving skills necessary to continue learning, to explore, and to teach themselves through a lifelong process of education. Technology offers new and better ways to help them succeed. This includes those learners who are limited English speakers and those joining the work force as well. Graduates need to understand the requirements, challenges, and benefits offered by a technological society. Teachers must deal with preparing students for tomorrow in new ways. They must be given 21st Century tools, learning environments, and training to allow them to link their instructional planning and a variety of appropriate strategies to produce optimum learning possibilities for their students.

The Commissioners and I recognize that this plan will challenge existing structures, patterns and budgets. This is what it is going to take to prepare the state's educational community for the 21st Century and put California where it belongs, at the top of the nation in its commitment to its learners. This Plan incorporates the best thinking of California's educational leadership. It represents the first step in an organized, history-making, statewide approach to using technology to improve learning. Collaborative partnerships are waiting to form and begin generating the energy necessary to move ahead. We look forward to the next steps in making the Plan a reality.

Phoebe Webb
Chairperson, California Planning Commission for Educational Technology

EXECUTIVE SUMMARY

In 1989 the Farr-Morgan-Quackenbush Technology Act (AB 1470) established the California Planning Commission for Educational Technology to develop a California Master Plan for Educational Technology. To complete its charge, the Commission discussed multiple issues; sponsored a summit conference on educational technology; gathered information on existing programs in California and other states; reviewed a variety of evaluation reports; sought the advice of educators and employers; and reviewed published and unpublished documents on educational technology.

The Commission has identified a number of objectives crucial to the future success of education in California and technology's contribution to that success. Chief among these objectives are: 1) equity of access to technology resources; 2) equity of resources anywhere learning and teaching occur; 3) coordination of resources from public and private providers; 4) electronic linking of educational agencies; and 5) the coordination of educational technology among the four segments of California public education: K-12 education, California Community Colleges, the University of California and the California State University.

The California Planning Commission for Educational Technology believes that technology will enhance students' learning; increase the intellectual productivity of faculty; and contribute to the management efficiency of administrators and staff through the use of instructional and information technologies.

COMMISSION RECOMMENDATIONS:

Recommendation 1: Technology in every learning environment.

Provide access to an array of information and instructional technology devices and instructional resources for every learner, faculty, and staff member in every teaching/learning environment.

Recommendation 2: Professional development and support.

Provide equity of access to sustained and ongoing professional development and technical support for every information technology user in the teaching/learning process.

Recommendation 3: *Golden State Education Network.*

Establish and coordinate a statewide integrated linking of voice, video, and data networks. This electronic linking is to be called the *Golden State Education Network*.

Recommendation 4: Instructional & information resource.

Improve existing and establish new statewide instructional and information resources.

Recommendation 5: Student data resource.

Establish a statewide student data resource for educators and administrators.

Recommendation 6: Management information system.

Establish a statewide administrative/management information resource.

Recommendation 7: Educational technology coordination.

Establish a state-level intersegmental education council and an industry council to collaboratively implement the Master Plan and to develop future plans.

Recommendation 8: Evaluating the implementation of the Master Plan.

Provide for ongoing evaluation of the extent and impact of the implementation of each recommendation of the Master Plan.

Recommendation 9: Resources to accomplish the Master Plan.

Develop substantial, sustained public and private funding mechanisms for the recommendations of the Master Plan.

The California Master Plan for Educational Technology contributes to teaching and learning in every sphere of California public education. The coordinated use of information technologies outlined in the Master Plan will enhance student learning; contribute to the intellectual growth and productivity of faculties; and increase the managerial and organizational efficiency of administrators and staff in California learning institutions.

California lawmakers can lend substantial support to the implementation of the California Master Plan for Educational Technology, but responsibility for implementing these recommendations falls on every person interested in a dynamic and equitable educational environment in California. Parents, teachers, administrators, employers, community leaders, and students must be enlisted to ensure full implementation of the California Master Plan for Educational Technology.

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INTRODUCTION TO THE MASTER PLAN

LEGISLATIVE AUTHORITY FOR THE MASTER PLAN

In 1989 the Farr, Morgan, Quackenbush Technology Act (AB 1470) established the California Planning Commission for Educational Technology to "develop a state master plan for educational technology, which would include priorities to guide the use and integration of educational technology in the public elementary, secondary, and postsecondary schools, taking into account and building upon, existing district, regional, and statewide plans." AB 1470 specified that the plan address a wide variety of issues ranging from governance to equity. The assembly bill states that the California Master Plan for Educational Technology shall include, but not be limited to, the following:

1. *Recommendations for an organizational and governance structure that oversees and/or coordinates educational technology activity in and across various educational segments.*
2. *Recommendations for funding in support of the appropriate expanded use of technology in education.*
3. *Identification of the following:*
 - a. *Critical educational problems and the role that technology may play in solving these problems.*
 - b. *Unmet educational, training, and informational needs and the role that technology may play in meeting the unmet needs.*
 - c. *The viability of establishing an educational network, or linking existing networks, to provide the state's educational community increased capacity and efficiency in transmitting video, data, and voice signals via telecommunications.*
4. *An assessment of the need for and feasibility of establishing comprehensive technology educational programs.*
5. *Recommendations for evaluation and accountability mechanisms for state-funded educational technology programs.*
6. *A proposed method for continuously gathering and disseminating current information on all aspects of educational technology to the state's educators.*
7. *A proposed strategy to implement the California Master Plan for Educational Technology.*

BACKGROUND FOR THE PLAN

Although the California Master Plan for Educational Technology addresses the present, its view is of the future. Implementation of and commitment to the Master Plan will result in major restructuring of the learning environment, but these changes need not abandon proven, existing programs and practices. In fact, current technology-based programs and practices provide a strong foundation for the new learning environments of the future. The Master Plan demonstrates a commitment to the improvement of education through the use of technology. It is only through partnerships of legislators, employers, professional educators, and others whose mission is to improve education in California, that the vision reflected in this Master Plan can become a reality.

Funding levels for educational technology in California are presently much lower than in many other states. The Master Plan recommendations for improving the quality of programs,

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equity of technology access, impact on managing resources, and accountability of state educational programs will require a significant increase in state funding for the resources necessary to accomplish its goals.

The many programs and projects funded during the past 10 years have resulted in much that should be considered for continuation or modification in the future¹. The external pressure to reform existing school organizational structures should not give rise to an arbitrary decision to abandon or discontinue successful programs and practices. The Commission recognizes, however, that we must critically examine programs and eliminate those which do not produce positive results. It also suggests that full implementation of the Master Plan may require substantial restructuring of the educational system. Any such restructuring effort must look at more effective ways to use and make available promising practices, products, and resources made possible by programs and projects previously authorized by state legislation. Future programs should be flexible enough to incorporate successful models from the past, while allowing for research into the educational advantage of emerging technologies and the subsequent introduction of new technologies into the learning environment.

PREVIOUS AND EXISTING PROGRAMS

The following provides a brief summary of educational technology programs previously and currently funded. This funding has established initiatives for the use of educational technology throughout the state but has not been sufficient to provide fundamental and far-reaching educational benefits for every student in California.

Funding in California's K-12 Classrooms - Since 1984 California has invested approximately \$122 million in over 25 different educational technology programs and projects to serve students in kindergarten through 12th grade. The two state legislative mandates that authorized and guided the K-12 funding were the Educational Technology Local Assistance Program of 1983 (AB 803; Chapter 1133 Statutes of 1983) and the Farr-Morgan-Quackenbush Educational Technology Act of 1989 (AB 1470; Chapter 1334 Statutes of 1989). The California Department of Education, with advice from the Educational Technology Committees, provided statewide program management.

The programs include school-level projects, regional service agencies, and a variety of resource development and dissemination projects. From 1984 through 1989 over \$80 million granted under AB 803 provided funding for: school-based grants to 79 percent of California schools; regional instructional television agencies to help educators use instructional video; video and software evaluation clearinghouses; consumer guides to assist in the selection of software and video; software development partnership projects; model technology demonstration and dissemination projects; the California Technology Project; and a variety of special projects.

AB 1470 reauthorized the Model Technology Schools, the California Technology Project, instructional television agencies, and software development projects. It also restructured the School-Based Grants Program, added Innovative Research and Development Grants, and established the California Planning Commission for Educational Technology to develop this California Master Plan for Educational Technology.

Program Funding in Postsecondary Education - During this period of AB1470 funding the state did not pass legislation providing specific funding for educational technology support at the post- secondary level. Funding for most postsecondary educational

technology programs has been provided from within the existing budgets for Community Colleges, the University of California, and the California State University system.

In 1970, the legislature established the Instructional Improvement and Evaluation Fund to promote excellence in teaching in higher education. The fund has been used annually to incorporate media in various teaching activities. Most recent examples from U.C. include hypermedia applications in geology, accounting, education, linguistics, computer science, engineering, and archeology, among others. Since 1985 special legislation has funded the Instructional Use of Computing (IUC) program for the University of California and the California State University. The IUC program has supported innovative uses of computing technologies in the instructional programs of nearly every undergraduate major at the University.

Community colleges use public broadcasting programs and localized microwave systems to broadcast telecourses. Some community college campuses also use their uplink capabilities to broadcast workshops, staff development and instructional programming.

The CSU system has created and funds CSUnet, a statewide telecommunications network connecting all campuses, as well as some K-12 sites. Several campuses utilize compressed video to reach other sites, taking advantage of fiber and T-1 linkages. Several of the CSU campuses have uplink capabilities to provide satellite broadcast of instructional programs, workshops, regional and national meetings, and teacher-training programs.

Particular departments within each of the colleges and universities have computer labs funded from local budgets. Some computer resources have been donated for special projects with some colleges and universities. Additionally, college students are often able to obtain discounts and special grants for computers. Finally, several college and university campuses provide extensive media departments that train students in the production of video and radio programming.

INFORMATION SOURCES FOR THE MASTER PLAN

To complete its charge, the Commission met frequently from January 1991 to March 1992 to discuss technology issues as they relate to the four segments of California public education: K-12 education, California Community Colleges, the University of California, and the California State University. In the course of those 15 months, the Commission consulted a wide variety of sources, ranging from published and unpublished studies to the proceedings of its own Commission meetings. Collaborating with key agencies and organizations,² the Commission developed a Master Plan that would be supported by the many different stakeholders in California's public education. The Commission's more important sources of information were:

Educational Technology Summit Conference - The Commission first convened a Summit Conference to bring stakeholders together to identify critical needs and make recommendations. On April 25, 1991, the authors of AB 1470 joined education and business leaders in a two-day Educational Technology Summit Conference. A total of 165 educators and policy makers, representing all segments of California's public education system, and members of the business community met to develop recommendations for the Master Plan.

Comprehensive Study of Educational Technology Programs - Far West Laboratory for Educational Research and Development, subcontracting with American Institutes for



Research, conducted an independent evaluation of California's educational technology programs to provide in-depth analysis and evaluation of all programs funded from 1984 to the present³.

The Strategic Plan for Information Technology - The Advisory Committee on Information Technology advised the California Department of Education on several information technology issues and developed the Strategic Plan for Information Technology⁴. This plan provides state-level recommendations for creating an information technology network for the K -12 public educational community. The recommendations made in this plan were considered during the development of the Master Plan.

Recommendations of the Educational Technology Committee - The Educational Technology Committee representing all levels of education, the State Board of Education, and employers made recommendations about future funding and program priorities for educational technology in California. The four members who sit on both the Committee and the Commission⁵ ensured that the interests and priorities of the Committee were reflected in the development of the Master Plan.

Meetings With Stakeholders - The Commission conducted six meetings with stakeholders throughout the state while the plan was being developed. Town Hall meetings were conducted in Northern and Southern California and in association with meetings of the Association of California School Administrators; Computer-Using Educators, Inc.; and the Association of California Community Colleges.

Other Sources of Information - The Industry Education Council of California Blue Ribbon Panel on Education and Technology⁶, the California State University Telecommunications Plan⁷, the Council for Chief State School Officers educational technology recommendations⁸, the State Architect's report on the infrastructure needs of new school construction⁹, and the California Postsecondary Education Commission report recommending state policy on distance learning¹¹, were all carefully reviewed by the Commission and used as sources for the Master Plan.

CALIFORNIA'S UNMET EDUCATIONAL NEEDS

California education is experiencing a crisis of need on many fronts. Many of the resource documents referred to above elaborate on the negative effect broad social issues have on teaching and learning in California. The California Master Plan for Educational Technology does not attempt to address the entire array of social problems that can hinder teaching and learning. Instead, the goal of the Master Plan is to identify the needs that can be addressed by technology and to make recommendations to meet the challenge of those needs. The Master Plan's recommendations are derived from the following categories of findings:

A wide disparity of student, staff, and faculty access to technology and technology resources exists in California. There is an urgent need for access to technology resources in every learning/teaching environment.

- *Existing funding often cannot be used for technology.*
- *Funding for technology hardware and software is inadequate and unstable.*
- *Penetration of technology into learning environments is uneven across various schools and colleges.*
- *School-home communications are not widely supported with technology.*
- *Incentives and guidelines for schools to incorporate and fund technology within existing local programs require strengthening.*
- *Existing statewide networks that provide services directly to schools are seldom used to address equity of access to technology.*
- *Standards and support for designing new schools and retrofitting existing school sites to accommodate technology is lacking.*
- *Educational discounts and group purchases of technology-based resources are not broadly available.*

The ability of all those involved in the teaching/learning process and its management and support to access technology and technology resources is not universal.

- *There is a lack of locally available, curriculum-based technology resources for staff development.*
- *Technology is often unavailable to delivery staff development.*
- *Educators have limited access to information about existing educational technology resources.*
- *Local planning and commitment to effective use of technology is inconsistent.*
- *Research and development projects to identify effective uses of new technologies in education are limited in scope and duration and their results have not been widely disseminated.*

Coordination of public and private providers of educational technology and related resources in California is limited.

- *There is a lack of systematic assessment of the use of technology-based materials by students and teachers.*
- *A statewide clearinghouse of information about exemplary technology systems, products, research, and available support programs does not exist.*
- *Successful models and promising practices in schools and colleges are not currently monitored in a comprehensive manner.*

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The many private and public electronic networks which serve education in California are not linked electronically.

- *There is no electronic network which connects existing regional resources, agencies, and institutions.*
- *Learning resources are not electronically available to all educators and students in California.*
- *Technology is not extensively used for timely and efficient storage and distribution of educational management information.*
- *An electronically accessible evaluation and research clearinghouse currently does not exist.*

The uses of educational technology are poorly coordinated and articulated within and between segments of California's public education system.

- *Unnecessary duplication of many technology resources should be eliminated and all technology resources should be used more efficiently.*
- *Coordination of resources for technology use among and within educational institutions must be expanded.*
- *Articulation of educational technology programs between K-12 and postsecondary education must be strengthened.*
- *Standards for program development, implementation, and evaluation across the educational segments are inconsistent.*

TECHNOLOGY IN CALIFORNIA'S TEACHING & LEARNING ENVIRONMENTS

It has long been a goal of California's schools, colleges, and universities to help its citizens become life-long learners who acquire the knowledge, skills, and attitudes required for present and future success in their work and personal lives, and for full democratic participation in a rapidly changing society. The Commission believes that educational technology supports is goal.

The specific role of technology in California's teaching/learning environment is to enhance students' learning, increase the intellectual productivity of faculty, and the management efficiency of administrators and staff through the use of instructional and information technologies. This can only be achieved through the accomplishment of the following:

The Master Plan must ensure ***Equity of Access*** to technology for all people involved in learning in California. The Plan must provide each individual with the means to access essential information and resources and the skills needed for life-long learning.

The Master Plan must provide ***Ubiquitous Access*** to information and technology any time and any place it is needed. No longer can the center for information be an isolated location such as a classroom or a library. Expansion of information resources to the home, work site, museum, or any other learning environment is essential to the accomplishment of pervasive, universal access to information.

The explosion of knowledge, the volume of the information available, and the disparity of its sources makes the ***Coordination of Resources*** an essential feature of any plan to bring diverse resources to the learner, the teacher, and all those who facilitate the teaching/learning process.

Because of their electronic nature, access to technological tools and resources is controlled by physical as well as institutional gatekeepers. The Master Plan must recommend an ***Electronic Linking of All Educational Agencies*** to provide the essential physical access to information resources and tools.

The effective and efficient use of technology in each segment of the California educational community in large measure depends upon the ***Coordination of All Segments of California's Public Education System***. The Master Plan establishes a method for that coordination to take place in support of technology's place in the educational process.

RECOMMENDED ACTIONS

To address these needs and meet the Commission's established objectives, the California Planning Commission for Educational Technology created the following recommendations to provide action steps for the Master Plan. No single source of funding is suggested to support these recommendations. Although existing state funds earmarked for educational technology will provide initial support for specific recommendations, much of the funding or support must come from businesses and from consumers who are interested in enhancing our citizens' personal, social, and economic status through the use of technology in education. Additionally, existing funding sources in each of the educational segments might be reallocated to implement some of these recommendations.

Although the implementation of these recommendations may require additional financial investment, the Commission projects long-term increases in the productivity of learners and faculty through effective instructional delivery. Further cost savings should be realized through economies of scale brought about by consolidation of resources and increased numbers of users of the technologies.

RECOMMENDATION 1: TECHNOLOGY IN EVERY LEARNING ENVIRONMENT

Provide access to an array of information and instructional technology devices and resources for every learner, faculty and staff member in every teaching/learning environment.

Implementation Actions

1. **Technology for All Faculty** - Provide an array of information and instructional technology devices and resources for all faculty members in each of the four public educational segments to meet their individual instructional, management, communication, and research needs.

Information and instructional technologies for a K-12 teacher might include a computer, laser videodisc player, printer, telephone, modem, VCR, CD Rom player, camcorder, tape recorder, and large television. The Education Council for Technology in Learning (see Recommendation 7) must establish standards for coordinating student and staff access to technology, i.e. number of students and staff per computer, printer, television, video and audio recording capability, playback equipment, and access to a variety of voice, video, and data resources to produce and receive information.

Although specific items of equipment have been identified, local discretion to choose and allocate resources is essential to the successful use of these technologies.

As new or upgraded technologies appear, the list of "ideal" technology-based resources may change significantly. Full accomplishment of these implementation actions may be phased over a period of five years and will make allowance for the continuous upgrading of these items as the implementation continues.

Time line: This recommendation must be accomplished by August 1997.

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2. **Technology for All Students** - Provide an array of information technology devices for all learners in each of the four public educational segments as appropriate to the students' learning environments, needs, and particular instructional programs.

Time line: This recommendation must be accomplished by August 1998.

3. **Technology for All Staff** - Provide an array of appropriate information technology devices for non-instructional staff and managers in each of the four public educational segments.

Time line: This recommendation must be fully implemented by August 1999.

4. **Coordinating Technology Into Existing Programs** - Provide planning guidelines, funding, and incentives for schools, colleges, and universities to incorporate and improve technology within existing local programs.

We must encourage K-12 schools to incorporate technology into existing school, district and institutional plans and initiatives. Incentives to use local funds to support the use of technology must be developed. The emphasis in this recommendation is for schools to involve the faculty, administration and staff in coordinated decision-making and planning for technology.

Time line: This recommendation must be fully implemented by August 1994.

5. **Community Partnerships** - Expand electronic delivery of instructional programs to work sites through partnerships between employers, educational agencies, institutions and community-based organizations.

Time line: This recommendation must be fully implemented by August 1994.

6. **Resource Development and Distribution** - Education and industry must collaboratively develop, implement, evaluate, replicate, and disseminate innovative programs and technology-based materials that are deemed to meet the needs of students and educators in California.

Successful K-12 models, such as the California Technology Project, site-based technology grants, consortia, instructional television agencies, organizations and projects which coordinate technology resources should continue to be funded in the short term to provide a continuing infrastructure for California K-12 education while the Master Plan is put in place.

Time line: This recommendation must be fully implemented by December 1994.

RECOMMENDATION 2: PROFESSIONAL DEVELOPMENT AND SUPPORT

Provide sustained, professional faculty and staff development and technical support for every information technology user in the teaching/learning process.

Implementation Actions

1. **Staff Development** - Expand opportunities for, and access to, staff development and technical assistance services to support effective use of technology in schools and other learning environments. Ensure the coordination of the services of all public and private providers in the delivery of pre-service and in-service professional development and technical assistance related to the use of technology in education.

Time line: This recommendation must be fully implemented by December 1994.

2. **Maintenance and Support** - Establish, supplement, or extend repair, maintenance, and technical support operations.

Create "full service" centers where faculty, staff members, and institutions receive assistance to facilitate operations related to acquisition and purchase of educational technology Tool Kits. These centers will consist of combinations of existing commercial operations, public facilities, and other newly-developed resources.

Time line: This recommendation must be fully implemented by December 1994.

3. **Certification and Evaluation** - Develop and implement improved performance-based standards for the use of technology in management and instruction to be used in teacher and administrator certification and evaluation.

Time line: This recommendation must be fully implemented by August 1995.

4. **Support Personnel** - Provide incentives and support personnel to help faculty, students, parents and business/industry use technology to successfully meet the learning, language, and cultural challenges encountered in the learning environment.

Mentors, technicians, credentialed library media professionals, and others are needed to provide the support necessary for successful integration of technology in the educational setting. Many schools and colleges already provide such personnel, and, in some cases, personnel can be redirected to meet this need. For many others, new personnel must be hired, and existing staff must be trained. The cost for hiring additional professional and technical personnel and maintaining a support system for the successful implementation of technology in education is unknown at this time.

Time line: This recommendation must be fully implemented by August 1995.

RECOMMENDATION 3: GOLDEN STATE EDUCATION NETWORK

Establish and coordinate a integrated voice, video, and data link of existing networks to be called the *Golden State Education Network*.

Implementation Actions

1. ***Planning the Golden State Education Network*** - Establish an expert communications engineering group to develop a phased plan for the integration of both terrestrial and satellite transmission services into a *Golden State Education Network*. The group will recommend the most cost-effective, equitable, and secure method for establishing this educational network. This group, with representatives from all major communications industries and all segments of California's public educational system, will address the use of existing public and private telephone wiring, fiber, satellite and terrestrial communications, cable, and other communications delivery mechanisms for improving and expanding intersegmental linkages where needed throughout California.

Time line: This recommendation must be fully implemented by December 1993.

2. ***Creating the Golden State Education Network***- Establish and maintain the coordinated *Golden State Education Network* to connect all of California's educational facilities to all appropriate educational resource delivery systems in all states and countries, where appropriate.

Time line: This recommendation must be fully implemented by December 1994.

3. ***Connection to the Golden State Education Network*** - All existing and new schools, colleges, and universities, will be appropriately constructed or retrofitted to support technology-enriched learning environments and to allow appropriate access to the *Golden State Education Network*.¹⁰

Time line: This recommendation must be fully implemented by August 1997.

RECOMMENDATION 4: INSTRUCTIONAL INFORMATION RESOURCES

Establish new and improve existing statewide instructional and information resources.

Implementation Actions

1. ***Building On Proven Resources*** - Ensure the continuation and enhancement of proven resources now used by educators in schools and institutions of higher education to support their integration of technology into curriculum and instructional programs.

Time line: This recommendation must be fully implemented by August 1994.

2. **Efficient Regional Assistance** - Increase efficiency, coordination, and delivery of regional assistance in a way that improves coordination among state projects and programs and expands the incorporation of technology into curriculum and instruction.

Effective collaboration, sharing of resources, and delivery will be achieved as appropriate to ensure the incorporation of technology into curriculum and instruction.

Time line: This recommendation must be fully implemented by August 1994.

3. **Shared Resources** - Establish a means to identify, develop, evaluate, acquire, catalogue, and deliver instructional resources. These resources should be aligned with the instructional frameworks and guidelines for each of the public education sectors and meet the needs of California's learners, including those who are not proficient English speakers.

Exemplary programs and projects which were funded in the past (publicly and privately funded), will be incorporated into the system where appropriate. Local, state, national, and international voice, video, and data learning resources will be easily accessible to learners as they seek to acquire the knowledge and skills described in the state's sophisticated curriculum frameworks and other instructional guidance documents. Each educational segment will establish information resources, such as the current Software and Video Clearinghouses, for determining the quality of existing learning resources. This effort will coordinate data on quality resources identified by the educational segments. Materials will be purchased or licensed for use, and current policies and regulations which now restrict the use of state and federal program funds to acquire technology-based learning resources need to be revised. Existing educational agencies will organize group-buys, and other resources will be available on a pay-for-use basis.

Time line: This recommendation must be fully implemented by August 1994.

4. **On-line Coordination** - Ensure that the instructional and information resources identified in this recommendation are made available on the *Golden State Education Network* and that these resources and others entered on the system are continuously monitored and maintained to ensure optimal utility to users.

Time line: This recommendation must be fully implemented by December 1994.

5. **Provisions for Limited English Speakers** - Develop a detailed, strategic plan for using the resources resulting from these recommendations to address the needs of all learners who are not proficient in the use of English. This plan will describe a strategy and an infrastructure to support the delivery of learning resources and services to learners who have limited English proficiency.

Time line: This recommendation must be fully implemented by August 1994.

RECOMMENDATION 5: STUDENT DATA RESOURCE

Establish a statewide student data resource for educators.

Implementation Actions

1. **Sharing Student Data** - Develop and implement the California Student Information System to encourage the sharing of appropriate information about students among educational institutions and with certified children's service providers.

Establish the California Student Information System to share information about learners in order to help students stay in the educational system. Student data will be shared among educational institutions and with certified children's service providers pursuant to all pertinent laws and regulations regarding release of student information. Full implementation will include participation by the Migrant Education Student Information System, Student Information System of the Community Colleges, California State University, and the University of California.

Time line: This recommendation must be fully implemented by December 1994.

2. **Ensuring Student Right to Privacy** - Ensure that the Golden State Educational Network regulates access to student information, protects the privacy of the individual, and continuously monitors and maintains the system.

Security and accuracy will be ensured by establishing criteria and monitoring of the system by the agencies responsible for implementation of the Information System. Students' rights to privacy need not be compromised while their rights to a free and appropriate education are being ensured. The appropriate regulatory agencies will monitor the student data resource to ensure learners' rights to privacy. Permission to use the data will be provided on a need-to-know basis and only to those who are certified to access the data base.

Although the annual maintenance costs are unknown, the implementation of this system will result in significant savings as various educational institutions eliminate some of the more cumbersome and time-intensive processes used currently to maintain student data.

Time line: This recommendation must be fully implemented by December 1994.

RECOMMENDATION 6: MANAGEMENT INFORMATION SYSTEM

Establish a statewide administrative/management information resource.

Implementation Actions

1. **Management Information Systems** - Expand on existing and provide for new administrative and management information systems to facilitate interaction and transmission of information within and between all educational agencies.

The system may include file transmission; fiscal data; state reports; student, personnel, and demographic information; the Education Code; interconnected E-mail; student applications to postsecondary institutions; advisories; student transcripts; forms; and special interest bulletin boards.

Time line: This recommendation must be fully implemented by December 1994.

2. **On-line Access To Management Information** - Ensure that the management information resources identified in this recommendation are made available on the *Golden State Education Network* and that these resources and others entered on the system are continuously monitored and maintained to ensure optimal utility to users.

Time line: This recommendation must be completed by December 1994.

RECOMMENDATION 7: EDUCATIONAL TECHNOLOGY COORDINATION

Establish a state-level, intersegmental, education council and an industry council to collaboratively implement the Master Plan and to direct future planning.

Implementation Actions

1. **The Educational Council for Technology in Learning** - Establish the *Education Council for Technology in Learning* (Education Council) to:
 - provide for planning within and between the four segments of California's public education system: the University of California, the California State University, the California Community Colleges, and K - 12 education;
 - ensure broad representation of educational technology stakeholders from the classroom to the legislature;
 - offer a strategic process for joint planning of technology initiatives by business and education; and
 - provide for a representative body that will advocate and communicate the issues and impact of the programs to key policy makers.

Education Council Membership - The Governor, the Legislature, the four public education segments and leading private sector organizations and employers will appoint members to the *Education Council* who will guide the implementation of the California Master Plan for Educational Technology. Appointed members to the Council will represent the California State University, the University of California, the California Community College, the California Department of Education, a regional staff development agency. The Education Council should include a certificated practicing elementary school teacher, a certificated practicing secondary school teacher, a public school administrator, business representatives, a State Board of Education member, a parent of a student in a California school, and a faculty representative from each of the postsecondary segments. The *Education Council* will include a minimum of 51% representation of persons involved in public education. All *Education Council* members shall be knowledgeable regarding technology applications in an educational setting and be selected by the appointing authorities based on documentation of such experience.

Education Council & Industry Council Crossover Membership - Four members will be elected by the *Education Council* to serve as its liaison to and members of the *Industry Council*. The four members from the *Education Council* and the four members from the *Industry Council* will serve as a joint executive committee (see *Implementation Action 2* below).

Duties of the Education Council - The *Education Council* shall:

- Advise the educational segments and their respective governing bodies on the implementation, monitoring, and revision, as needed, of the California Master Plan for Educational Technology;
- Collaborate with the *Industry Council* in the establishment of Master Plan implementation funding priorities and identification of needs for technology in education;
- Establish guidelines for collaboratively funding projects and partnerships between industry and education;
- Establish and implement a process for evaluating educational technology partnership programs and projects;
- Establish and implement guidelines for intersegmental cooperation regarding educational technology school programs and initiatives;
- Advise the governing bodies of the participating education segments on efforts to ensure equal student access to educational technology programs;
- Recommend to the governing bodies of the participating education segments an annual budget identifying proposed funding levels for intersegmental educational technology programs;
- Coordinate state planning and implementation of the Master Plan technology programs and projects with the *Industry Council for Technology in Learning*.

Time line: This recommendation must be fully implemented by July, 1993.

3. **Support for the Education Council by Educational Segments** - Each of the four educational segments shall establish an executive level position to coordinate the educational technology programs and projects for that segment. These administrators will be provided with adequate staff and operating budgets to administer technology-based programs within their segments and to support the recommendations of the *Education*

Council. Technology planning, implementation, and evaluation shall be jointly developed by these technology managers and the *Education Council*.

Duties of the Education Segments: Duties shall include, but not be limited to, the following:

- Advise the *Education Council* on educational technology plans, policies, programs, and activities;
- Ensure that all educational initiatives, reform efforts, advisories, and guidelines include applications of technology where it is appropriate and feasible to do so;
- Promote the use of technology to support state goals for faculty and staff development, curriculum reform, administration of instructional programs, and testing and evaluation procedures;
- Collaborate with other program leaders in this plan to support the implementation of the California Master Plan for Educational Technology;
- Establish guidelines for upgrading existing facilities and developing new facilities to accommodate the installation of current and future technologies;
- Facilitate intensive courses of study for pre-service and credentialed education personnel in appropriate and effective uses of technology.

Time line: This recommendation must be fully implemented by October 1993.

2. ***Collaboration with the Industry Council for Technology in Learning*** - This plan endorses the development of a collaboration of major industry partners, small business, and other major California employers to establish the *Industry Council for Technology in Learning* (Industry Council) as a non-profit California corporation. The *Industry Council* will serve as a holding company to receive and allocate funding and resources to support the programs and projects established by the Master Plan.

Education Council & Industry Council Crossover Membership - Four members will be elected by the *Industry Council* to serve as its liaison to and members of the *Education Council*. Four members will be elected by the *Education Council* to serve as its liaison to and be members of the *Industry Council*. The four members from the *Education Council* and the four members from the *Industry Council* will serve as a joint executive committee (see *Implementation Action 1 above*).

Organizational Structure of the Councils - Figure 2 shows the organization of the Councils. This organizational structure provides for communication between educators and the private sector in planning and implementing an educational technology program in California.

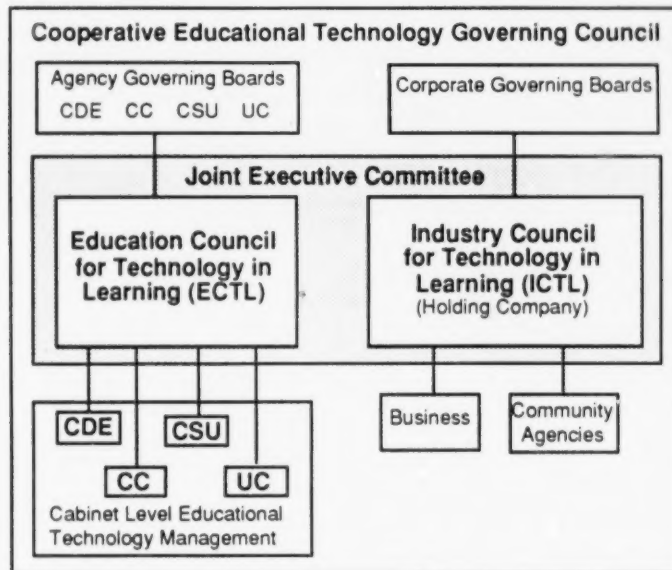


Figure 1

Time line: This recommendation must be fully implemented by July 1993.

RECOMMENDATION 8: EVALUATING THE IMPLEMENTATION OF THE MASTER PLAN

Provide for ongoing evaluation of the extent and impact of the implementation of each program and an external evaluation of the effectiveness of the program to include the proposed governance for the plan.

Implementation Actions

1. **Measuring Outcomes** - The Educational Council for Technology in Learning will supervise the development, design, and implementation of evaluation criteria for technology programs in California and, with the concurrence of the segment, will select external evaluators to assess and report on the educational outcomes of such programs. This evaluation shall also address the effectiveness of the governance structure established by this Master Plan.

Time line: This recommendation must be fully implemented by August 1992.

2. **Annual Report of the Education Council** - The Education Council for Technology in Learning shall prepare an annual report to the Governor and the Legislature. This report will document the progress made by the Education Council in implementing the Master Plan, its plans to extend and revise the Master Plan, and its evaluation of

the overall effectiveness of the use of educational technology in California's learning environments.

Time line: This recommendation must be fully implemented by August 1992.

RECOMMENDATION 9: RESOURCES TO ACCOMPLISH THE MASTER PLAN

Provide substantial, sustained public and private funding mechanisms for these recommendations.

Implementation Actions

1. **Legislative Funding** - The Legislature should provide funding to fully implement each of the recommendations indicated in this plan within the time line proposed. The *Education Council* and the *Industry Council* will support this effort with background data and recommendations as required.

Time line: This recommendation must be fully implemented by July 1993.

2. **Future Funding Recommendations** - The *Education Council* and *Industry Council* will jointly consider and recommend to the Legislature future funding options for educational technology.

Time line: This recommendation must be fully implemented by July 1993.

3. **Local Resources to Support the Master Plan** - Funding for Master Plan programs will require carefully developed strategic plans, evaluation procedures and some local resources within each educational sector.

Time line: This recommendation must be fully implemented by July 1993.

4. **Other Sources of Funding** - The four educational agencies represented on the *Education Council* shall provide funding for staff, operating expenses, and facilities. The segments will also actively seek local and business funding and/or support to fully implement each of the recommendations indicated in the Plan within the time line suggested. State government and agencies will actively seek federal funding and support to fully implement each of the recommendations indicated in this plan within the suggested time line.

Time line: This recommendation must be fully implemented by July 1993.

Private sector support of the implementation of the Master Plan shall be provided through in-kind and cash donations and through direct investments in California education. Employers will be encouraged to strengthen education through:

- 1) Political support;
- 2) Business plan assistance; and
- 3) Industry and educational planning.

5. **Per Student Funding:** The Legislature should fund expansion of educational technology in each of the four segments at the rate of \$100 per K-12 student Average

Daily Attendance and \$100 for postsecondary Full Time Equivalent student. These funds should not displace funding currently used for educational technology.

Time line: This recommendation must be fully implemented by July 1993.

IMPLEMENTATION TIME LINE

Recommendations	Time line				
	1993	1994	1995	1996	1997
	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND
R7-1 Establish Educational Council for Learning in Technology	Δ				
R7-2 Establish the Industry Council for Technology in Learning	Δ				
R9 Provide substantial and sustained funding	Δ				
R7-3 Establish executive positions in each of the segments	Δ				
R3-2 Expand Communications Engineering Group reports	Δ	Δ			
R4-3 Establish center for coordinating resources	Δ				
R1-4 Establish guidelines and resources	Δ				
R1-5 Establish business linkages	Δ				
R4-1 Continue/enhance proven resources	Δ				
R4-2 Increase regional assistance	Δ				
R4-5 Develop a strategic plan for LEP	Δ				
R8 Provide for ongoing independent evaluation	Δ				
R3-3 Implement Golden State Education Network	Δ				
R4-4 Provide resources on the Golden State Education Network	Δ				
R2-1 Expand staff development and technical assistance	Δ				
R1-6 Disseminate innovative programs and related information	Δ				
R1 Implement California Student Information System		Δ			
R5-2 Regulate access to student information		Δ			
R6-1 Expand administrative information system	Δ				
R2-2 Develop a network of repair and technical support		Δ			
R2-3 Establish standards for technology use in schools			Δ		
R2-4 Provide expanded incentives and support to all users	Δ				
R1-1 Provide Technology tools for all teachers		Δ			
R1-2 Provide Technology tools for all students		Δ			
R1-3 Provide Technology tools for non instructional staff		Δ			
R3-1 Construct or retrofit facilities			Δ		

CONCLUSION

If California learners are to meet the challenges of tomorrow, they must have access today to the communication tools that will prepare them for work place responsibilities. These tools will enhance the quality of their lives, and help them make decisions as informed citizens in a democratic society.

Although no uniform plan has been in place for using technology in California's educational community, the demand for its use in the classroom is expected to grow at an explosive rate as teachers incorporate video, computers, multimedia and other new technologies into the learning day. Presently, efforts to introduce technology in the classroom are disjointed and uneven. The Master Plan for Educational Technology takes practical steps to ensure quality information access for all California learners in the foreseeable future.

The recommendations in the Master Plan are not without initial cost, but in the long-run, increased and efficient use of technology in education can reduce costs by providing streamlined, efficient information systems that deliver better and more flexible services.

Building consensus in education around a common Master Plan for Educational Technology poses a unique set of challenges and remains a primary goal for implementing any vision of enhancing California's educational goals through the use of technology. The California Planning Commission for Educational Technology offers the Master Plan for Educational Technology as a first step in building the broad consensus that will move California learners into the 21st Century.

California lawmakers can lend substantial support to the implementation of the California Master Plan for Educational Technology, but responsibility for implementing these recommendations falls on every person interested in a dynamic and equitable educational environment in California. Parents, teachers, administrators, employers, community leaders and students must be enlisted to ensure full implementation of the California Master Plan for Educational Technology.

FOOTNOTES/RESOURCE DOCUMENTS

- 1 Far West Laboratory For Educational Research and Development, *The Analysis of the Impact of California Educational Technology Regional and Local Assistance Programs*, San Francisco, 1991
- 2 *Participant list from the California Educational Technology Summit: Proceedings*, California Planning Commission for Educational Technology, Far West Laboratory, San Francisco, 1991
- 3 Far West Laboratory for Educational Research and Development, *The Analysis of the Impact of California Educational Technology Regional and Local Assistance Programs*, San Francisco, 1991
- 4 California Department of Education, *Strategic Plan For Information Technology*, San Francisco, 1991
- 5 Commission members who also sit on the Educational Technology Committee are: Mary Ann Carr of IBM Corporation; Christine Stortz of Cupertino Union School District and Apple Classroom of Tomorrow; John A. Vaile of Tracy Public Schools and Computer-Using Educators, Inc.; and Phoebe Webb of the Regional Educational Television Advisory Council.
- 6 Office of the Chancellor, Information Resources and Technology, *The Plan for Telecommunications in the CSU: 1992-95*, Seal Beach, CA, 1991
- 7 Policy Statement of the Council for Chief State School Officers: Improving Student Performance through Learning Technologies, unpublished document, 1992
- 8 Office of the State Architect, Department of General Services, State of California, *A Report to the Legislature on Distribution Infrastructures for Advanced Technologies in the Construction of New Schools, K-12*, Sacramento, CA, 1991
- 9 California Postsecondary Education Commission, *The Development of State Policy on Technology for Distance Learning*, Sacramento, CA, 1991

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